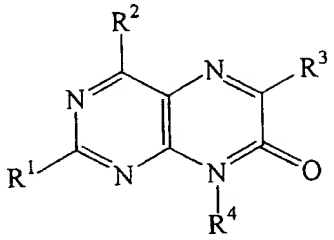
WHAT IS CLAIMED IS:

Sub A2

1. A compound of the formula:



wherein:

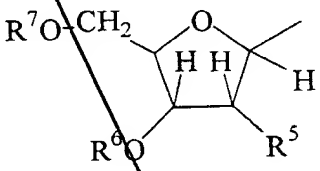
R^1 is a member selected from the group consisting of hydrogen and optionally substituted C_1-C_6-alkyl;

R^2 is a member selected from the group consisting of amino and mono- or di-substituted amino wherein the substituent is a protecting group;

R^3 is optionally substituted C_1-C_6 alkyl;

R^4 is a member selected from the group consisting of hydrogen and L;

L is of the formula



wherein:

R^5 is a member selected from the group consisting of hydrogen, hydroxyl, and substituted hydroxyl wherein the substituent is a protecting group;

R^6 is a member selected from the group consisting of hydrogen, phosphoramidite, an H-phosphonate, a methyl phosphonate, a phosphorothioate, a phosphotriester, a hemisuccinate, a hemisuccinate covalently bound to a solid support, a dicyclohexylcarbodiimide, and a dicyclohexylcarbodiimide covalently bound to a solid support, a hydroxyalkyl, and a hydroxyalkyl covalently bound to a solid support; and

R^7 is a member selected from the group consisting of hydrogen, a phosphate, a triphosphate, and a protecting group;

with the proviso that R^1 and R^4 are not simultaneously L.

2. A compound in accordance with claim **1**, wherein R^1 is hydrogen;

R^2 is a member selected from the group consisting of amino, mono-, and di-substituted amino wherein the substituents are members selected from the group consisting of benzoyl, isobutyryl, phthaloyl, di-n-butylaminomethylidene,

dimethylaminomethylidene, p-nitrophenylethoxycarbonyl and dimethylaminomethylenamino;

R^4 is L;

R^5 is a member selected from the group consisting of hydrogen, hydroxyl, hydroxyl substituted with a member selected from the group consisting of trityl, monomethoxytrityl, dimethoxytrityl, tetrahydropyran-1-yl, 4-methoxytetrahydropyran-4-yl, 1-(2-chloro-4-methyl)phenyl-4-methoxypiperidin-4-yl, t-butyldimethylsilyl, p-nitrophenylethylsulfonyl, tetrahydropyranyl, 4- methoxytetrahydropyranyl, 2-nitrobenzyl, 9-phenylxanthen-9-yl and p-nitrophenylethyl;

R^6 is a member selected from the group consisting of consisting of hydrogen, phosphoramidite, H-phosphonate, hemisuccinate, and hemisuccinate covalently bound to a solid support; and

R^7 is a member selected from the group consisting of hydrogen, trityl, monomethoxytrityl, dimethoxytrityl, phthaloyl, di-n-butylaminomethylene, dimethylaminomethylidene and triphosphate.

3. A compound in accordance with claim **2**, wherein R^2 is a member selected from the group consisting of amino and an amino group mono-substituted by a protecting group selected from the group consisting of di-n-butylaminomethylidene, p-nitrophenylethoxycarbonyl, and dimethylaminomethylenamino;

R^5 is a member selected from the group consisting of hydrogen, hydroxyl and hydroxyl substituted with a member selected from the group consisting of dimethoxytrityl, tetrahydropyran-1-yl, t-butyldimethylsilyl, 2-nitrobenzyl, and p-nitrophenylethylsulfonyl;

R^6 is a member selected from the group consisting of hydrogen, β-cyanoethyl-N-diisopropyl phosphoramidite and a hemisuccinate covalently bound to controlled pore glass; and

R^7 is a member selected from the group consisting of dimethoxytrityl, di-n-butylaminomethylene, and dimethylaminomethylidene.

4. A compound in accordance with claim **2**, wherein R^2 is a member selected from the group consisting of amino and an amino group mono-substituted by a protecting group selected from the group consisting of di-n-butylaminomethylidene, p-nitrophenylethoxycarbonyl, and dimethylaminomethylenamino;

R^5 is a member selected from the group consisting of hydrogen and hydroxyl substituted with a member selected from the group consisting of dimethoxytrityl, tetrahydropyran-1-yl, t-butyldimethylsilyl, 2-nitrobenzyl, and p-nitrophenylethyl;

R^6 is a member selected from the group consisting of hydrogen and β-cyanoethyl-N-diisopropyl phosphoramidite; and

R^7 is a member selected from the group consisting of hydrogen and dimethoxytrityl.

5. A compound in accordance with claim **2**, wherein R^2 is a member selected from the group consisting of amino and dimethylaminomethylenamino;

R^3 is methyl;

R^5 is hydrogen;

R^6 is β-cyanoethyl-N-diisopropyl phosphoramidite; and

R^7 is dimethoxytrityl.

6. A compound in accordance with claim **2**, wherein R^2 is amino;

R^3 is methyl;

R^5 is hydrogen;

R^6 is β-cyanoethyl-N-diisopropyl phosphoramidite; and

R^7 is dimethoxytrityl.

7. A compound in accordance with claim **2**, wherein R^2 is amino;

R^3 is methyl;

R^5 is hydrogen;

R^6 is hydrogen; and

R^7 is hydrogen.

8. A compound in accordance claim **2**, wherein R^2 is dimethylaminomethylenamino;

R^3 is methyl;

R^5 is hydrogen;

R^6 is β-cyanoethyl-N-diisopropyl phosphoramidite; and

R^7 is dimethoxytrityl.

9. A compound in accordance with claim **2**, wherein R^2 is amino;

R^3 is methyl;

R^5 is hydrogen;

R^6 is β-cyanoethyl-N-diisopropyl phosphoramidite; and

R^7 is a triphosphate.

10. A compound in accordance with claim **1**, wherein;

R^1 is optionally substituted C_1-C_6 alkyl;

R^2 is a member selected from the group consisting of amino, mono-, and di-substituted amino wherein the substituent is a member selected from the group consisting of benzoyl, isobutyryl, phthaloyl, di-n-butylaminomethylidene, dimethylaminomethylidene, p-nitrophenylethoxycarbonyl and dimethylaminomethylenamino;

R^3 is optionally substituted C_1-C_6 alkyl;

R^4 is L;

R^5 is a member selected from the group consisting of hydrogen, hydroxyl and hydroxyl substituted with a member selected from the group consisting of trityl, monomethoxytrityl, dimethoxytrityl, tetrahydropyran-1-yl, 4-methoxytetrahydropyran-4-yl, 1-(2-chloro-4-methyl)phenyl-4-methoxypiperidin-4-yl, t-butyldimethylsilyl, p-nitrophenylethylsulfonyl, tetrahydropyranyl, 4- methoxytetrahydropyranyl, 2-nitrobenzyl, 9-phenylxanthen-9-yl and p-nitrophenylethyl;

R^6 is a member selected from the group consisting of hydrogen, H-phosphonate, phosphoramidite, hemisuccinate, and hemisuccinate covalently bound to a solid support; and

R^7 is a member selected from the group consisting of hydrogen, trityl, monomethoxytrityl, dimethoxytrityl, phthaloyl, di-n-butylaminomethylene, and dimethylaminomethylidene.

11. A compound in accordance with claim **10** wherein R^1 is methyl;

R^2 is a member selected from the group consisting of amino and an amino group mono-substituted by a protecting group selected from the group consisting of di-n-butylaminomethylidene, p-nitrophenylethoxycarbonyl, and dimethylaminomethylenamino;

R^3 is methyl;

R^5 is a member selected from the group consisting of hydrogen, hydroxyl and hydroxyl substituted with a member selected from the group consisting of dimethoxytrityl, tetrahydropyran-1-yl, t-butyldimethylsilyl, 2-nitrobenzyl, and p-nitrophenylethylsulfonyl;

R^6 is a member selected from the group consisting of hydrogen, β-cyanoethyl-N-diisopropyl phosphoramidite and a hemisuccinate covalently bound to controlled pore glass; and

R^7 is a member selected from the group consisting of dimethoxytrityl, di-n-butylaminomethylene, and dimethylaminomethylidene.

12. A compound in accordance claim **10**, wherein R^1 is methyl; R^2 is a member selected from the group consisting of amino and an amino group mono-substituted by a protecting group selected from the group consisting of di-n-butylaminomethylidene, p-nitrophenylethoxycarbonyl, and dimethylaminomethylenamino;

R^5 is a member selected from the group consisting of hydrogen and hydroxyl substituted with a member selected from the group consisting of dimethoxytrityl, tetrahydropyran-1-yl, t-butyldimethylsilyl, 2-nitrobenzyl, and p-nitrophenylethylsulfonyl;

R^6 is a member selected from the group consisting of consisting of hydrogen and β-cyanoethyl-N-diisopropyl phosphoramidite; and

R^7 is a member selected from the group consisting of hydrogen and dimethoxytrityl.

13. A compound in accordance with claim **10**, wherein R^1 is methyl; R^2 is a member selected from the group consisting of amino and dimethylaminomethylenamino;

R^3 is methyl;

R^5 is hydrogen;

R^6 is β-cyanoethyl-N-diisopropyl phosphoramidite; and

R^7 is dimethoxytrityl.

14. A compound in accordance with claim **10**, wherein R^1 is methyl; R^2 is amino;

R^3 is methyl;

R^5 is hydrogen;

R^6 is β-cyanoethyl-N-diisopropyl phosphoramidite; and

R^7 is dimethoxytrityl.

15. A compound in accordance with claim **10**, wherein R^1 is methyl; R^2 is amino;

R^3 is methyl;

R^5 is hydrogen;

R^6 is hydrogen; and

R^7 is hydrogen.

16. A compound in accordance with claim **10**, wherein R^1 is methyl; is dimethylaminomethylenamino;

R^3 is methyl;

R^5 is hydrogen;

R^6 is β-cyanoethyl-N-diisopropyl phosphoramidite; and

R^7 is dimethoxytrityl.

17. A compound in accordance with claim **10**, wherein R^1 is methyl; R^2 is amino;

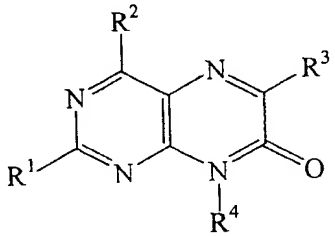
R^3 is methyl;

R^5 is hydrogen;

R^6 is β-cyanoethyl-N-diisopropyl phosphoramidite; and

R^7 is a triphosphate.

18. An oligonucleotide comprising one or more nucleotide monomers, said monomers having the formula



wherein:

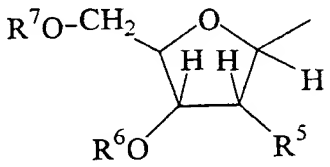
R^1 is a member selected from the group consisting of hydrogen and optionally substituted C_1-C_6-alkyl;

R^2 is a member selected from the group consisting of amino and mono- or di-substituted amino wherein the substituent is a protecting group;

R^3 is optional substituted C_1-C_6 alkyl;

R^4 is L;

L is of the formula



wherein:

R^5 is a member selected from the group consisting of hydrogen and hydroxyl;

R^6 is a member selected from the group consisting of hydrogen, a phosphate, a phosphate covalently attached to a nucleotide, a phosphate covalently attached to a nucleoside; a hemisuccinate covalently bound to a solid support, a dicyclohexylcarbodiimide covalently bound to a solid support, and a hydroxyalkyl covalently bound to a solid support; and

R^7 is a member selected from the group consisting of hydrogen, a phosphate, a phosphate covalently attached to a nucleotide and a phosphate covalently attached to a nucleoside;

with the proviso that R^1 and R^4 are not simultaneously L.

19. An oligonucleotide in accordance with claim **18**, wherein:

R^1 is hydrogen;

R^2 is amino;

R^3 is methyl;

R^5 is hydrogen and hydroxyl;

R^6 is hydrogen; and

R^7 is a phosphate.

20. An oligonucleotide in accordance with claim **19,** wherein:

R^5 is hydrogen.

21. An oligonucleotide in accordance with claim **19** wherein:

R^5 is hydroxyl.

22. An oligonucleotide in accordance with claim **18**, wherein:
R^1 is optionally substituted C_1-C_6-alkyl;
R^2 is amino;
R^3 is methyl;
R^5 is hydrogen and hydroxyl;
R^6 is hydrogen; and
R^7 is a phosphate.

23. An oligonucleotide in accordance with claim **22**, wherein
R^1 is methyl and
R^5 is hydrogen.

24. An oligonucleotide in accordance with claim **22**, wherein
R^1 is methyl and
R^5 is hydroxyl.

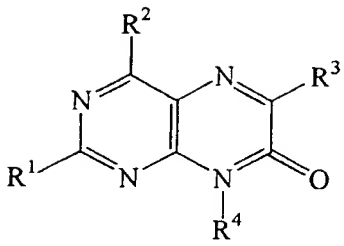
25. An oligonucleotide in accordance with claim **18**, wherein said nucleotide monomers are at the 3' end of said oligonucleotide.

26. An oligonucleotide in accordance with claim **18**, wherein said nucleotide monomers are at the 5' end of said oligonucleotide.

27. An oligonucleotide in accordance with claim **18**, wherein said nucleotide monomers are surrounded by 1 to 10 pyrimidine monomers.

28. An oligonucleotide in accordance with claim **18**, wherein said oligonucleotide is a member selected from the group consisting of SEQ ID:1, SEQ ID:2, SEQ ID:3, SEQ ID:4, SEQ ID:5, SEQ ID:6, SEQ ID:7, SEQ ID:8, SEQ ID:9, SEQ ID:10, SEQ ID:11, SEQ ID:12, SEQ ID:13, SEQ ID:14, SEQ ID:15, SEQ ID:16, SEQ ID:17, SEQ ID:18, SEQ ID:19, SEQ ID:20, SEQ ID:21 and SEQ ID:22.

29. A method of detecting the presence, absence, or quantity of a target nucleic acid, said method comprising the steps of:
a)contacting said target nucleic acid with a nucleic acid probe wherein said nucleic acid probe comprises compound of the formula:



wherein:

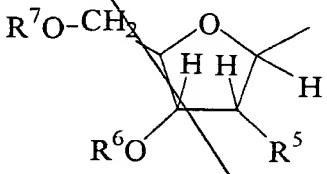
R^1 is a member selected from the group consisting of hydrogen and optionally substituted C_1-C_6-alkyl;

R^2 is a member selected from the group consisting of amino and mono- or di-substituted amino wherein the substituent is a protecting group;

R^3 is optionally substituted C_1-C_6 alkyl;

R^4 is L;

L is of the formula



wherein:

R^5 is a member selected from the group consisting of hydrogen and hydroxyl;

R^6 is a member selected from the group consisting of hydrogen, phosphoramidite, an H-phosphonate, a methyl phosphonate, a phosphorothioate, a phosphotriester, a hemisuccinate, a hemisuccinate covalently bound to a solid support, a dicyclohexylcarbodiimide, and a dicyclohexylcarbodiimide covalently bound to a solid support; and

R^7 is phosphate;

with the proviso that R^1 and R^4 are not simultaneously L; located in said probe such that, when said probe hybridizes to said target nucleic acid said compound is in a loop that does not participate in complementary base pairing with a nucleotide of said target nucleic acid; and

b)detecting the fluorescence produced by said fluorescent nucleotide when said probe forms a hybrid duplex with said target nucleic acid.

30. A method of claim **29**, wherein said loop ranges in length from about 1 to about 100 nucleotides when said probe hybridizes to said target nucleic acid.

31. A method of claim **29**, wherein said loop is an insertion in said nucleic acid probe which is otherwise complementary to said target nucleic acid or to a contiguous subsequence of said target nucleic acid.

32. A method of claim **31**, wherein said insertion is three nucleotides in length and comprises two nucleotides each adjacent to said compound.

33. A method of claim **32,** wherein at least one nucleotide adjacent to said compound is a purine.

34. A method of claim **33,** wherein at least one nucleotide adjacent to said compound is an adenosine.

35. A method of claim **32**, wherein at least one nucleotide adjacent to said compound is a pyrimidine.

36. A method of claim **35**, wherein at least one nucleotide adjacent to said compound is a cytosine.

37. A method of claim **34**, wherein said compound is bordered by at least two adjacent purines in both the 5' and 3' direction.

38. A method of claim **37**, wherein said adjacent purines are adenosine.

39. A method of claim **31**, wherein said insertion is said compound.

40. A method of claim **31**, wherein said insertion is self-complementary and forms a hairpin wherein said compound is present in the loop of said hairpin and does not participate in complementary base pairing.

41. A method of claim **29**, wherein the nucleotides comprising said loop are selected such that they are not complementary to the corresponding nucleotides of the target nucleic acid when said probe is hybridized to said target nucleic acid and wherein said probe is complementary to at least two non-contiguous subsequences of said target nucleic acid.

42. A method of claim **29**, wherein said fluorescent nucleotide is present in a terminal subsequence of said nucleic acid probe wherein said terminal

subsequence does not hybridize to said target nucleic acid when the remainder of said nucleic acid probe hybridizes to said target nucleic acid.

43. A method of claim **42**, wherein said terminal subsequence forms a terminal hairpin by hybridization with a second subsequence of said probe such that said fluorescent nucleotide is present in a loop of said hairpin and does not participate in complementary base pairing.

44. A method of claim **29**, wherein said detecting comprises detecting an increase in fluorescence of said fluorescent nucleotide when said probe forms a hybrid duplex with said target nucleic acid.

45. A kit for the detection of nucleic acid-nucleic acid interactions comprising a container, said container containing a compound in accordance with claim **1**, and instructions for use.

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